

Spot Safety Project Evaluation

Project Log # 200611080

Spot Safety Project # 09-01-207

**Project Evaluation of the Four-Way Stop Signs and Center Island Installation
At the Intersection of SR 1147 (Salisbury St. / Hardison St.) and S. Davie Drive / Salisbury St.
Davie County**

Documents Prepared By:

Safety Evaluation Group
Traffic Safety Systems Management Section
Traffic Engineering and Safety Systems Branch
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Principal Investigator

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Traffic Safety Project Engineer

1-30-2007
Date

Project Evaluation Documentation

Subject Location

The Intersection of SR 1147 (Hardison St. / Salisbury St.) and S. Davie Dr. / Salisbury St. in Davie County.

Project Information

The project improvement countermeasure chosen for the subject location was the installation of a 4-way stop control and two center traffic islands on the southbound and westbound approaches of Salisbury Street. The improvement was requested by the Division in response to a request by the Mocksville Town Manager.

The treatment location is located within the City of Mocksville, with primarily residential development and South Davie Middle School located in the southwest quadrant. Prior to the project improvement, the location was controlled by stop signs located on South Davie Drive and westbound Salisbury Street with left turn lanes on these two approaches. All intersection approaches are two-lane facilities at the treatment intersection with a speed limit of 35 mph.

According to the initial crash analysis, there were 13 crashes at the treatment location within a 3-year period, 10 of which were considered treatable by the four-way stop control improvement. The 4-way stop and center island installations were installed and operational on December 2, 2002 at a total cost of \$5,000.00.

Naïve Before and After Analysis

After reviewing all of the crashes at the subject location, the crash data omitted from this analysis to consider for an adequate construction period was from October 1, 2002 through January 31, 2003. The before period consisted of reported crashes from March 1, 1999 through September 30, 2002 (3 Years, 7 Months) and the after period consisted of reported crashes from February 1, 2003 through August 31, 2006 (3 Years, 7 Months). The ending date for this analysis was determined by the available crash data at the time the crash analysis was completed.

The treatment data consisted of all crashes within 150 feet of the intersection of SR 1147 (Hardison St. / Salisbury St.) and S. Davie Drive / Salisbury Street. Please see the attached *Location Map* for further detail.

The following table depicts the Naïve Before and After Analysis for the Total Crashes and Target Crashes at the treatment location. Please note that Frontal Impact Crashes were the target crashes for the applied countermeasure. The Frontal Impact Crash types considered are as follows: Left Turn-Same Roadway, Left Turn-Different Roadways, Right Turn-Same Roadway, Right Turn-Different Roadways, Head On, and Angle.

Treatment Information

| | Before | After | Percent Reduction (-)/ Percent Increase (+) |
|-----------------------|---------------|--------------|--|
| Total Crashes | 9 | 2 | - 77.78 % |
| Total Severity Index | 3.47 | 4.70 | 35.45 % |
| | | | |
| Target Crashes | 8 | 1 | - 87.50 % |
| Target Severity Index | 3.78 | 8.40 | 122.22 % |
| | | | |
| Volume | 7,400 | 8,300 | 12.16 % |

| <u>Target Crash Information</u> | Before | After | Percent Reduction (-)/ Percent Increase (+) |
|---------------------------------|---------------|--------------|--|
| Fatal Injury Crashes | 0 | 0 | N/A |
| Non-Fatal Injury Crashes | 3 | 1 | - 66.67 % |
| Total Injury Crashes | 3 | 1 | - 66.67 % |
| Night Crashes | 0 | 0 | N/A |
| Wet Crashes | 1 | 0 | - 100.00 % |

The naïve before and after analysis at the treatment location resulted in a 78 percent decrease in Total Crashes, an 88 percent decrease in Target Crashes, and a 12 percent increase in Average Daily Traffic (ADT). The before period ADT year was 2000 and the after period ADT year was 2004.

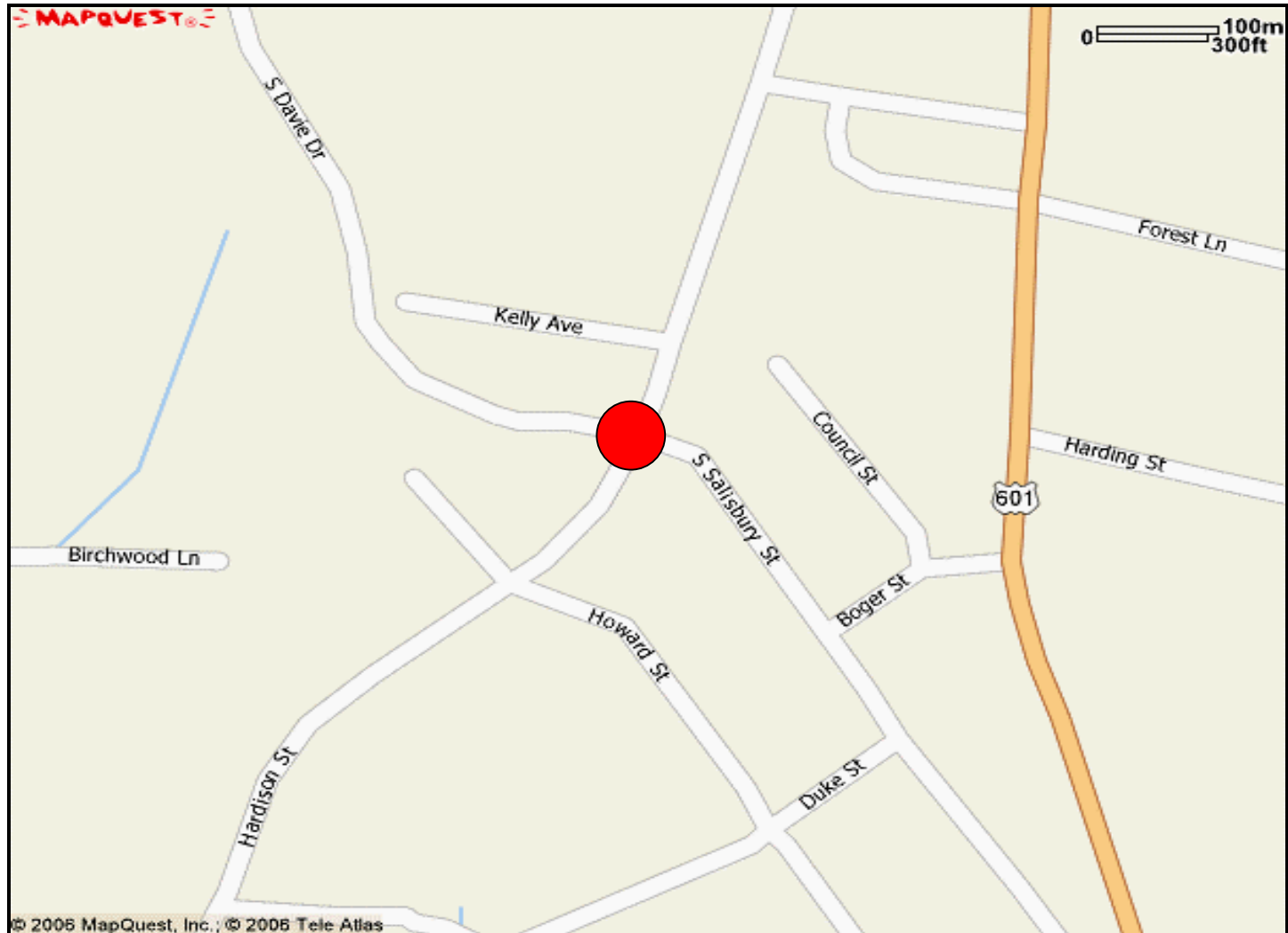
Results and Discussion

The naïve before and after analysis involving the comparison of treatment actual before data versus treatment actual after data resulted in a 78 percent decrease in Total Crashes and an 88 percent decrease in Target Crashes. Further investigation shows that the Severity Index of Total and Target Crashes increased by 35 percent and 122 percent, respectively. The summary results above demonstrate that the Treatment Location appears to have had a substantial decrease in both Total and Target Crashes from the before to after period using naïve methodologies.

The treatment location experienced a considerable increase in crash severity, although this appears misleading. Target Injury Crashes decreased by 88 percent from the before to the after period. In the before period, Target Crashes resulted in two Class-B injury crashes, one class-C injury crash, and six PDO crashes. In the after period, Target Crashes resulted in one Class-B injury crash. Analysis of the crash data in the after period reveals that the target crash at the treatment intersection was caused by the vehicle at fault running through the stop sign on SR 1147 (Salisbury Street). Crashes involving vehicles at fault “running the stop sign” was reduced from four crashes in the before period to only one in the after period.

As the Safety Evaluation Group completes additional reviews for this type of countermeasure, we will be able to provide more objective and definite information regarding actual crash reduction factors.

Location Map
Davie County
Evaluation of Spot Safety Project # 09-01-207



Treatment Location: Intersection of SR 1147 (Salisbury St. / Hardison St.) and S. Davie Dr.

TREATMENT SITE PHOTO TAKEN 12/19/2006



Traveling West on Salisbury Road



Traveling West on Salisbury Rd (Notice location of Middle School)



Traveling East on S. Davie Drive



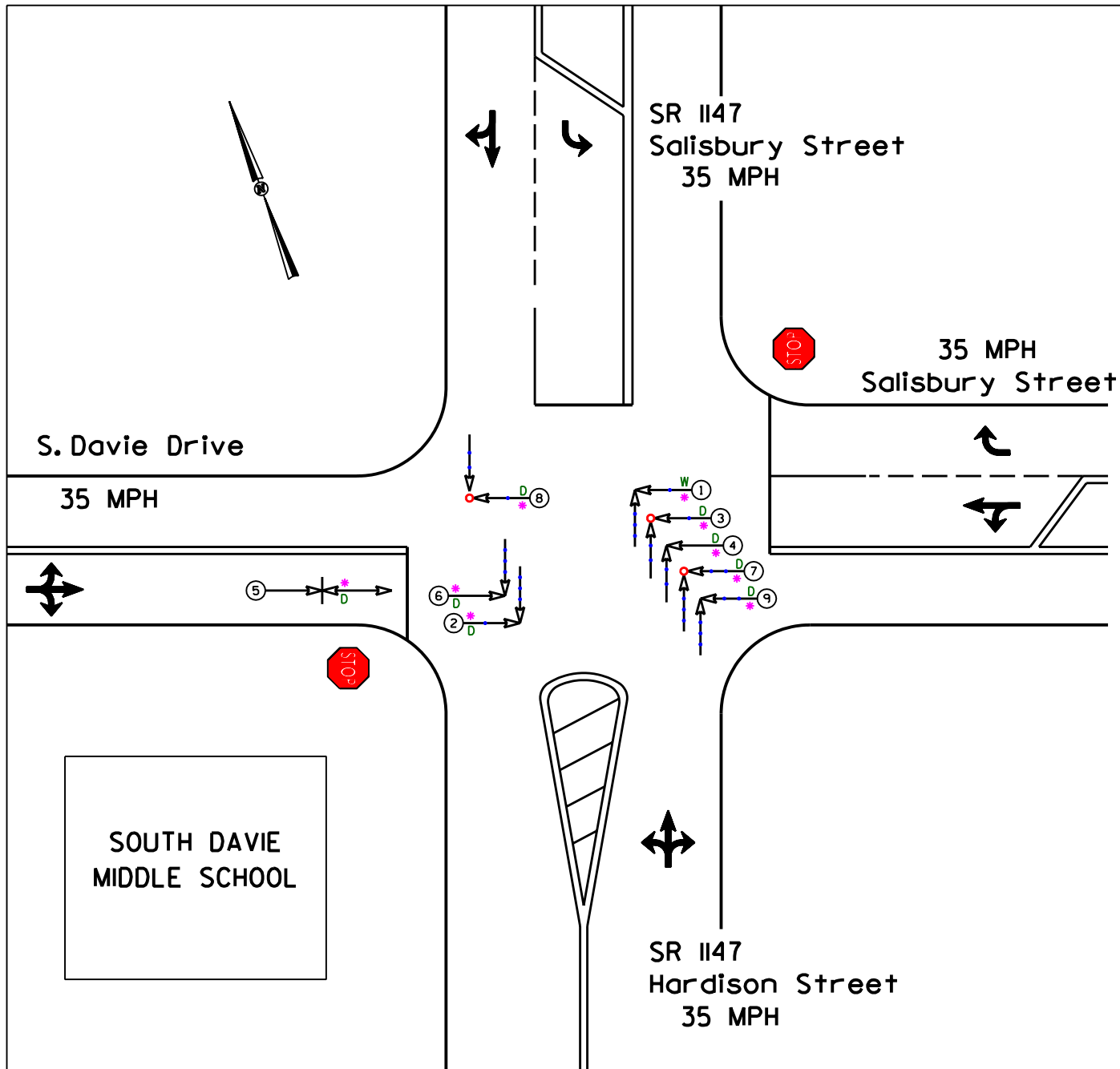
Traveling North on SR 1147 (Hardison Street)



Traveling South on SR 1147 (Salisbury Street)



Traveling South on SR 1147 (Salisbury Street)



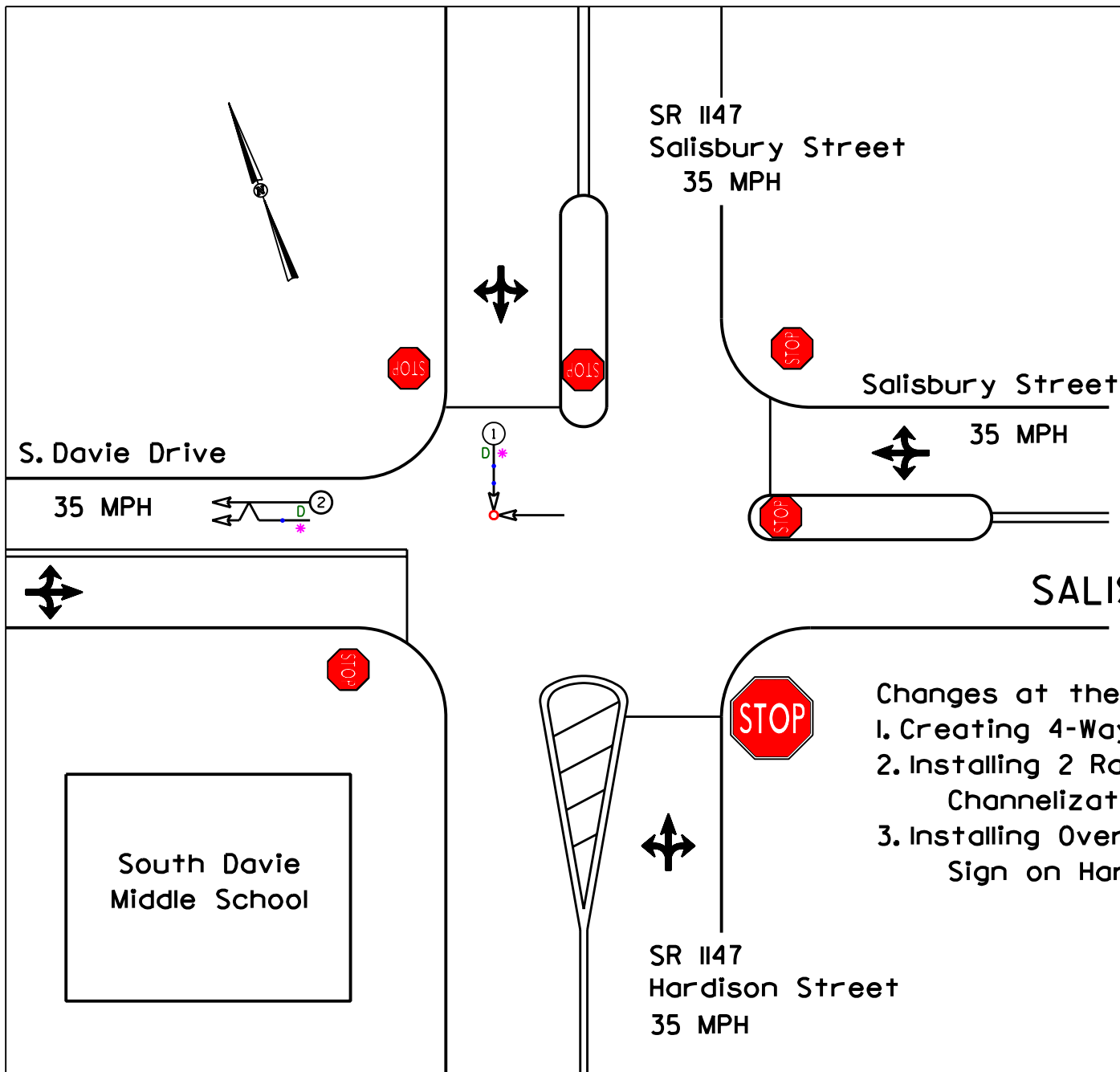
| LEGEND | | | |
|-----------------|----------------|-----------------|-------------------|
| MOVING VEHICLE | ANGLE | → 9 MPH OR LESS | P PEDESTRIAN |
| PEDESTRIAN | TURNING | → 10 MPH TO 19 | T TRAIN |
| PAVED VEHICLE | BACKING | → 20 MPH TO 29 | • DRIVER AT FAULT |
| PARKING VEHICLE | SIDEWALK | → 30 MPH TO 39 | D DRY |
| FIXED OBJECT | OUT OF CONTROL | → 40 MPH TO 49 | W WET |
| HEAD ON | HAZARD | → 50 MPH TO 59 | I ICE OR SNOW |
| REAR END | FATALITY | → 60 MPH TO 69 | O ONLY |
| RAN OFF ROAD | | → 70 AND UP | |
| | | → SPEED UNKNOWN | |

SS# 09-01-207
DAVIE COUNTY
BEFORE PERIOD
3/1/1999 - 9/30/2002
SALISBURY ST. at
HARDISON ST.

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

| COLLISION DIAGRAM | |
|-------------------------------------|---------------------------|
| DIVISION: 9 | AREA: |
| STUDY PERIOD: 3/1/1999 TO 9/30/2002 | DISTANCE: Y-LINE + 150 FT |
| ANALYSIS PREPARED BY: JBS | ANALYSIS CHECKED BY: CS |
| DIAGRAM PREPARED BY: JBS | DIAGRAM REVIEWED BY: ST |
| SCALE: | NOT TO SCALE |
| DATE: 12-4-2006 | LOG NUMBER: SS# 09-01-207 |

N.C. DEPARTMENT of TRANSPORTATION
DIVISION of HIGHWAYS
TRAFFIC ENGINEERING AND SAFETY
SYSTEMS BRANCH



| LEGEND | | | |
|--------|----------------|--|-------------------|
| | MOVING VEHICLE | | ANGLE |
| | PEDESTRIAN | | TURNING |
| | PAKED VEHICLE | | BACKING |
| | FIXED OBJECT | | SIDESWIPE |
| | HEAD ON | | OUT OF CONTROL |
| | REAR END | | INJURY |
| | RAN OFF ROAD | | FATALITY |
| | | | 9 MPH OR LESS |
| | | | 10 MPH TO 19 |
| | | | 20 MPH TO 29 |
| | | | 30 MPH TO 39 |
| | | | 40 MPH TO 49 |
| | | | 50 MPH TO 59 |
| | | | 60 MPH TO 69 |
| | | | 70 AND UP |
| | | | SPEED UNKNOWN |
| | | | P PEDESTRIAN |
| | | | T TRAIN |
| | | | D DRIVER AT FAULT |
| | | | D DRY |
| | | | W WET |
| | | | I ICE OR SNOW |
| | | | O ONLY |

SS# 09-01-207
 DAVIE COUNTY
 AFTER PERIOD
 2/1/2003 - 8/31/2006
 SALISBURY ST. at HARDISON ST.

- Changes at the Intersection Include:
1. Creating 4-Way Stop Control
 2. Installing 2 Raised Channelization Medians
 3. Installing Oversized Stop Sign on Hardison

TRAFFIC SAFETY SYSTEMS MANAGEMENT UNIT

| | | |
|---------------------------|-------------------------------------|-------|
| | COLLISION DIAGRAM | |
| | DIVISION: 9 | AREA: |
| | STUDY PERIOD: 2/1/2003 TO 8/31/2006 | |
| | DISTANCE: 1-LINE = 150 FT | |
| | ANALYSIS CHECKED BY: CS | |
| DIAGRAM PREPARED BY: JBS | | |
| DIAGRAM REVIEWED BY: ST | | |
| SCALE: NOT TO SCALE | | |
| DATE: 12-4-2006 | | |
| LOG NUMBER: SS* 09-01-207 | | |

N.C. DEPARTMENT of TRANSPORTATION
 DIVISION of HIGHWAYS
 TRAFFIC ENGINEERING AND SAFETY
 SYSTEMS BRANCH